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Development of the Heat – Health Vulnerability Tool in North Carolina

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Outline

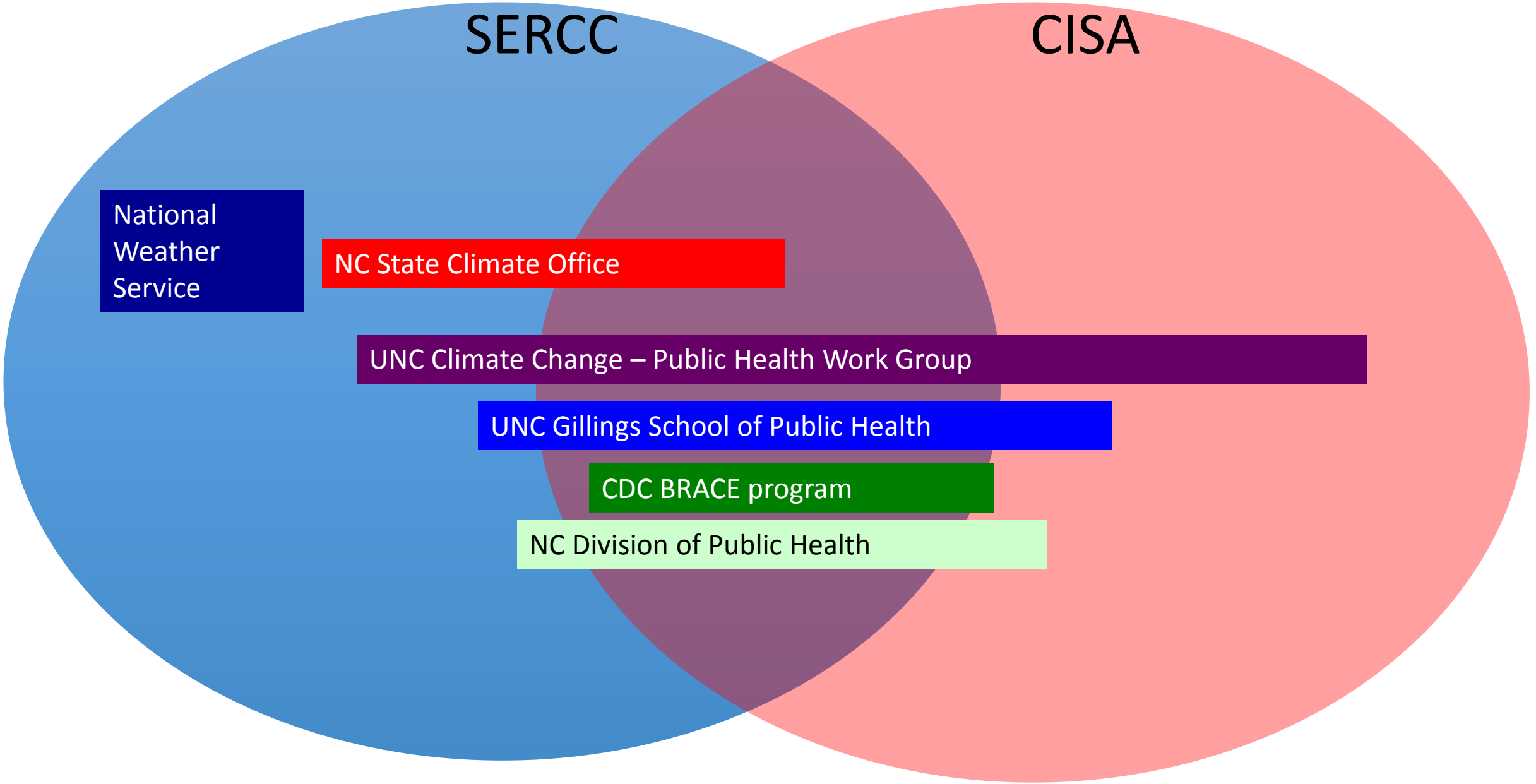
1) Background

2) Research to Identify Relationships between Temperature and Heat Illness.

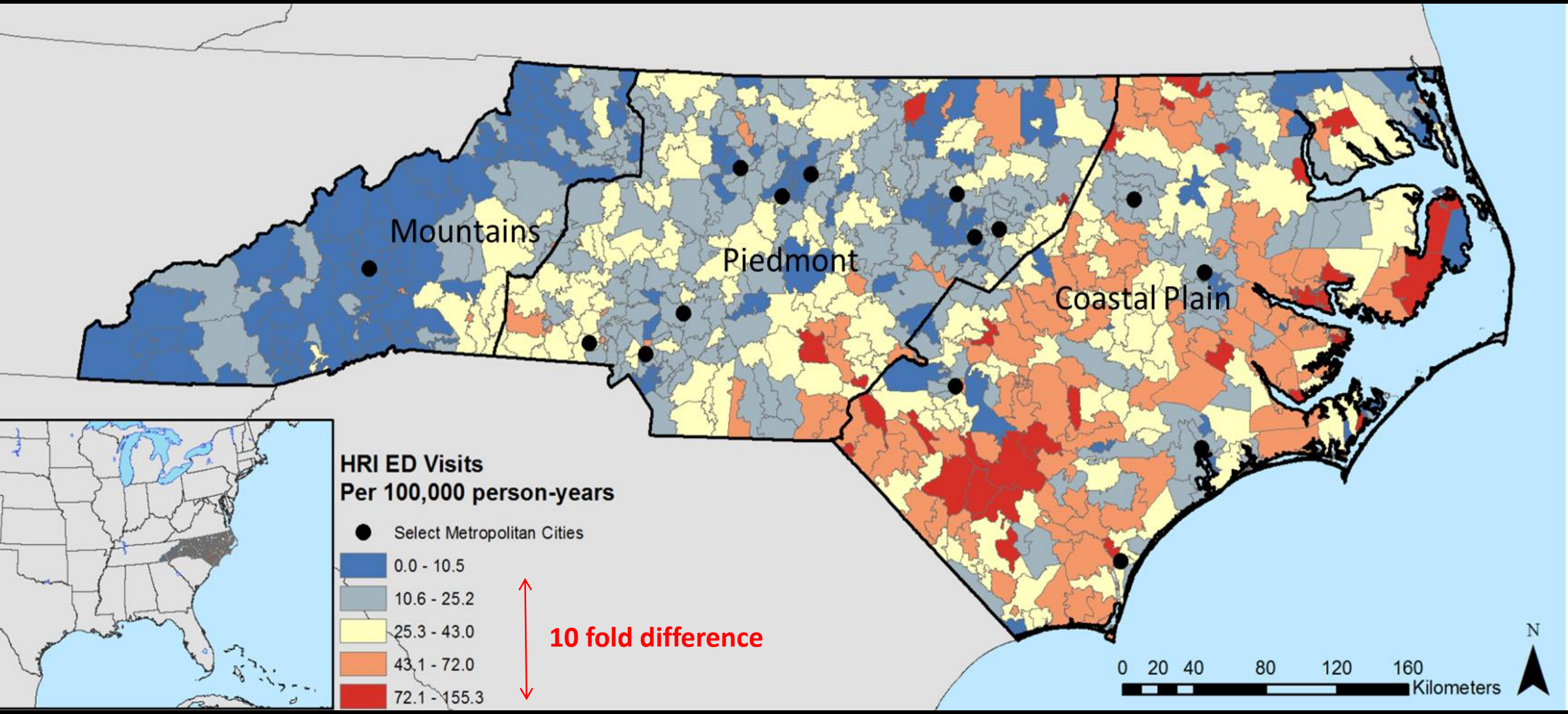
3) Description of Heat Health Vulnerability Tool

4) Our Engagement with Stakeholders and What we Learned

Collaborators on Heat Illness Project

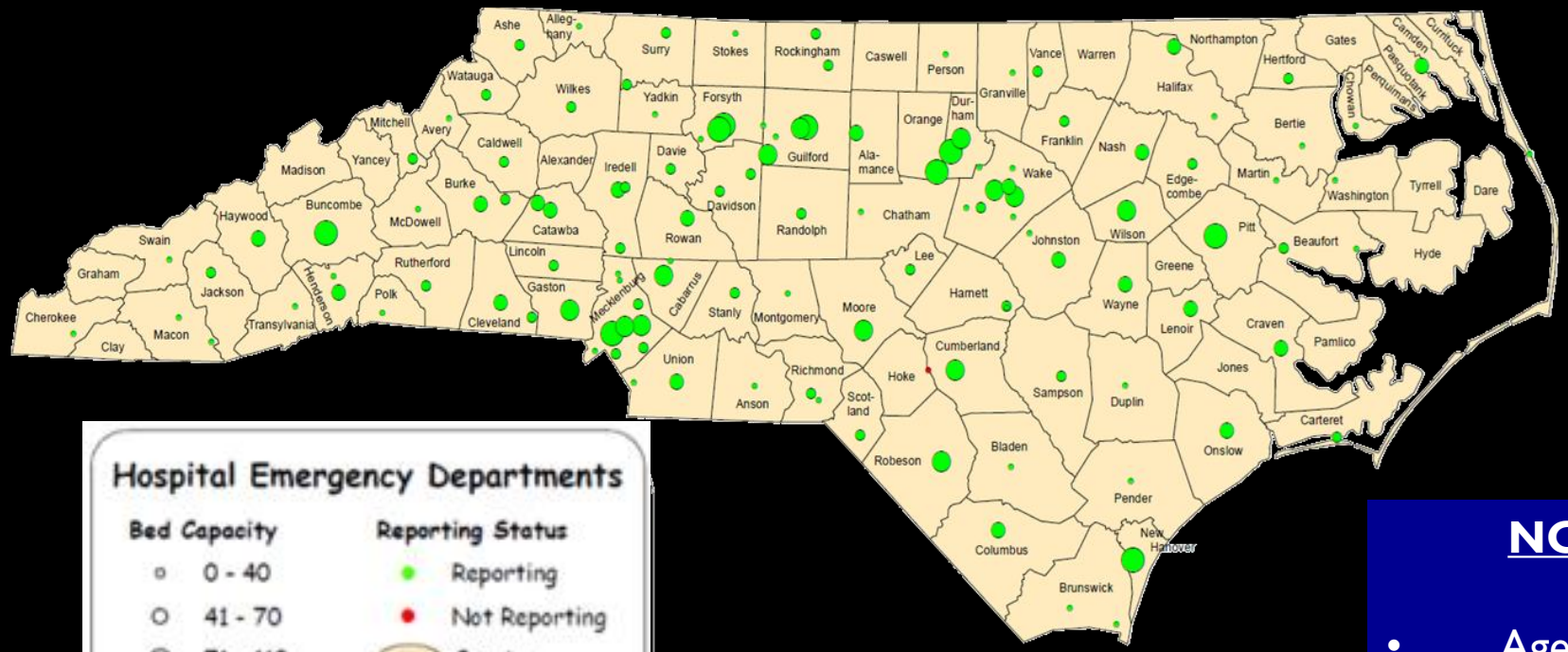


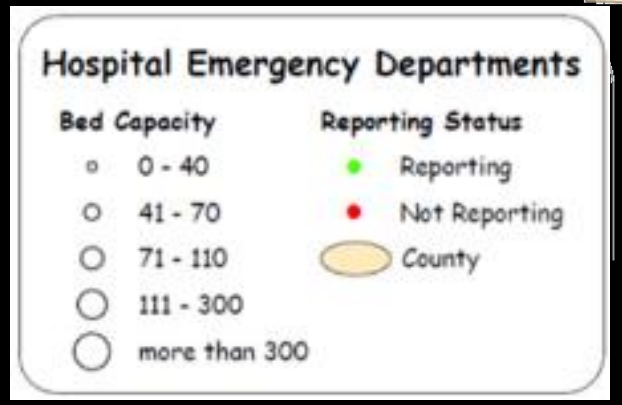
Marked Variation in Heat Illness Across North Carolina



2. Determining Relationships between Temperature and Heat Illness

North Carolina Disease Event Tracking and Epidemiologic Tool (NC DETECT)

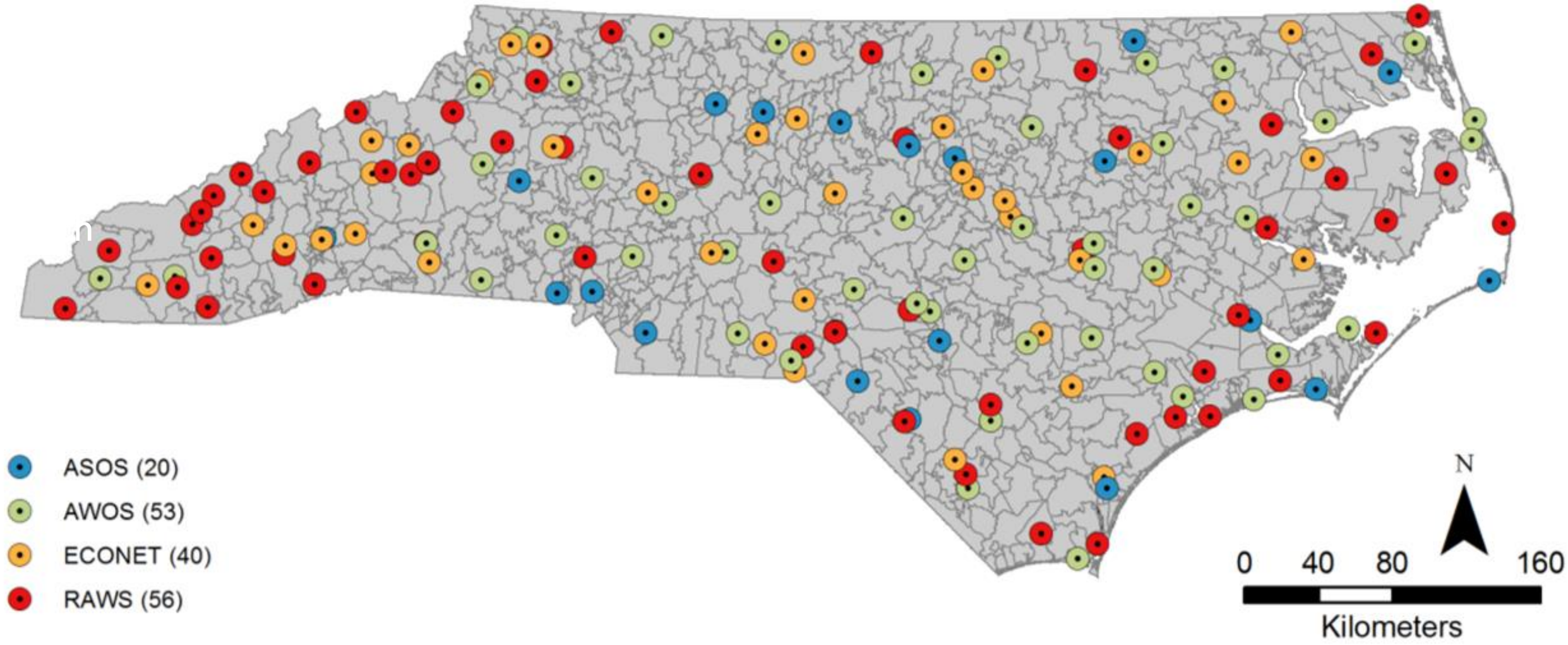




NC- DETECT (2007 – 2012)

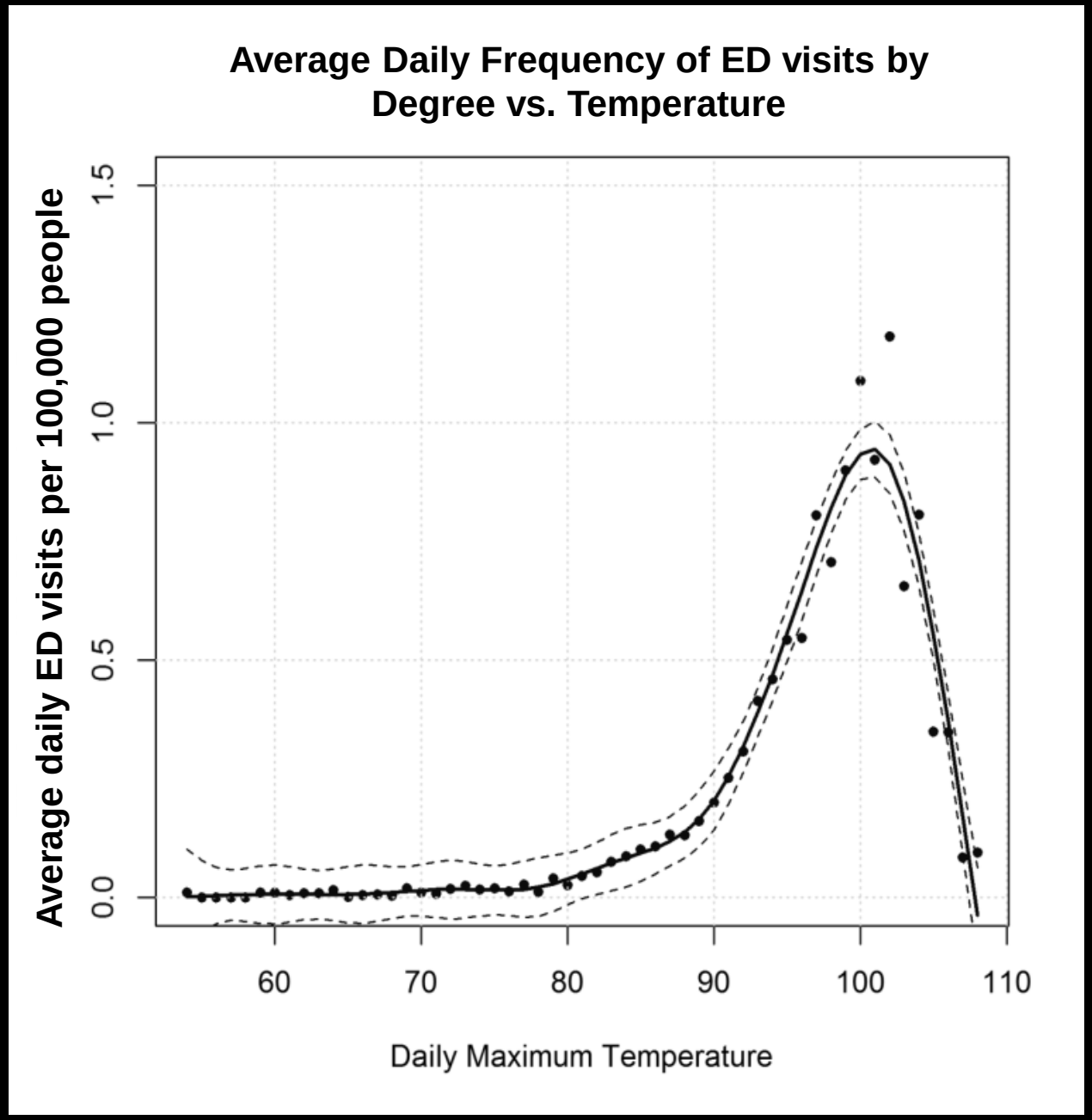
- Age
- Gender
- Date and Time of Visit
- All diagnostic codes(992)
- Zip code/County
- Insurance information

ED visit linked to the daily maximum temperature at the nearest weather station.



HRI rates are adjusted for the frequency of temperature observations → ***Average daily HRI ED Visits Per 100, 000 people***

More ED visits on abnormally hot (95 to 100F) days but marked decrease in HRI rates at the highest temperatures (greater than 100F)



Rural Urban Commuting Areas (RUCA) Classification

Metropolitan

Rural Metropolitan

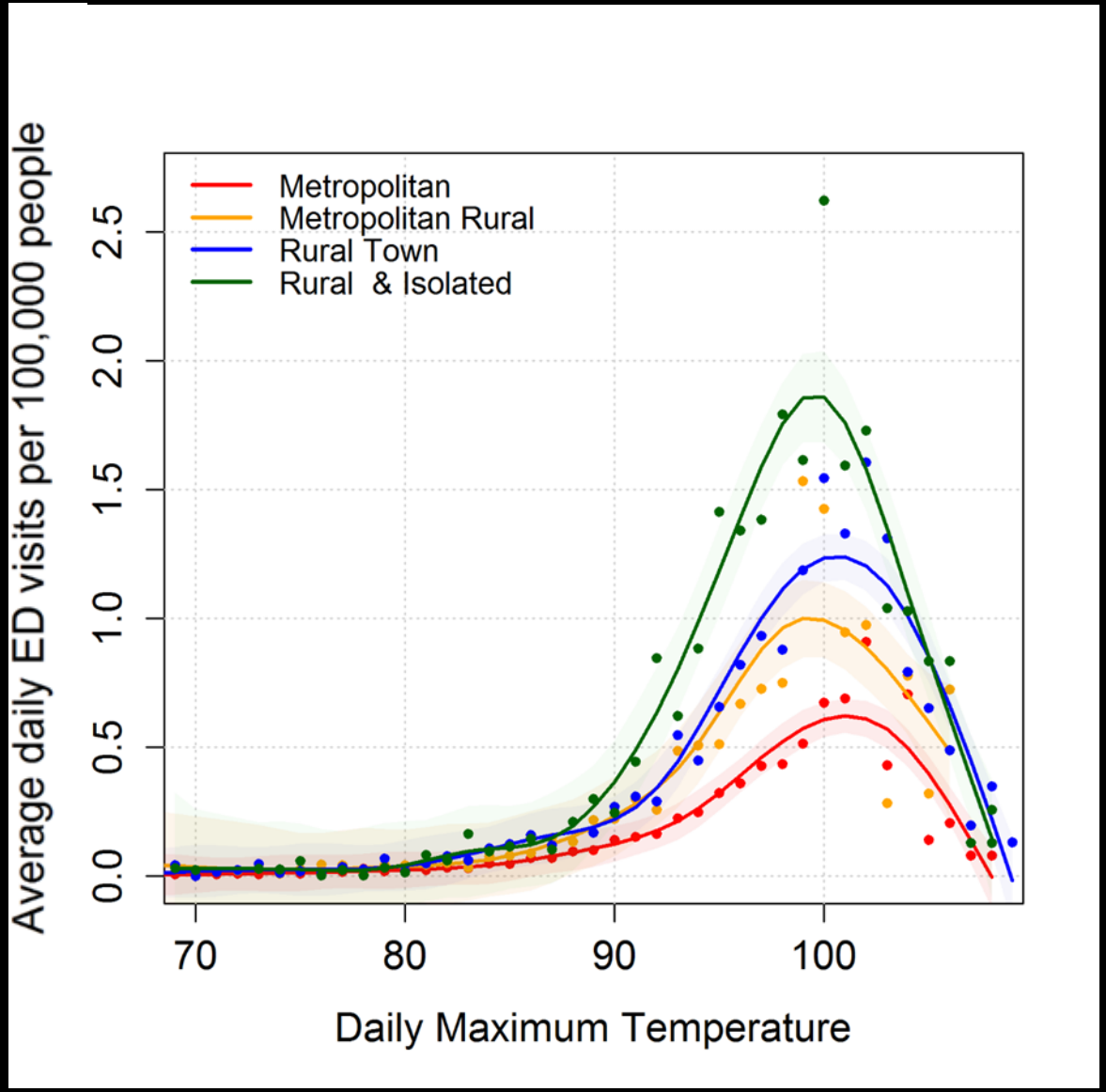
Rural Town

Rural Isolated

Most Urban

Most Rural

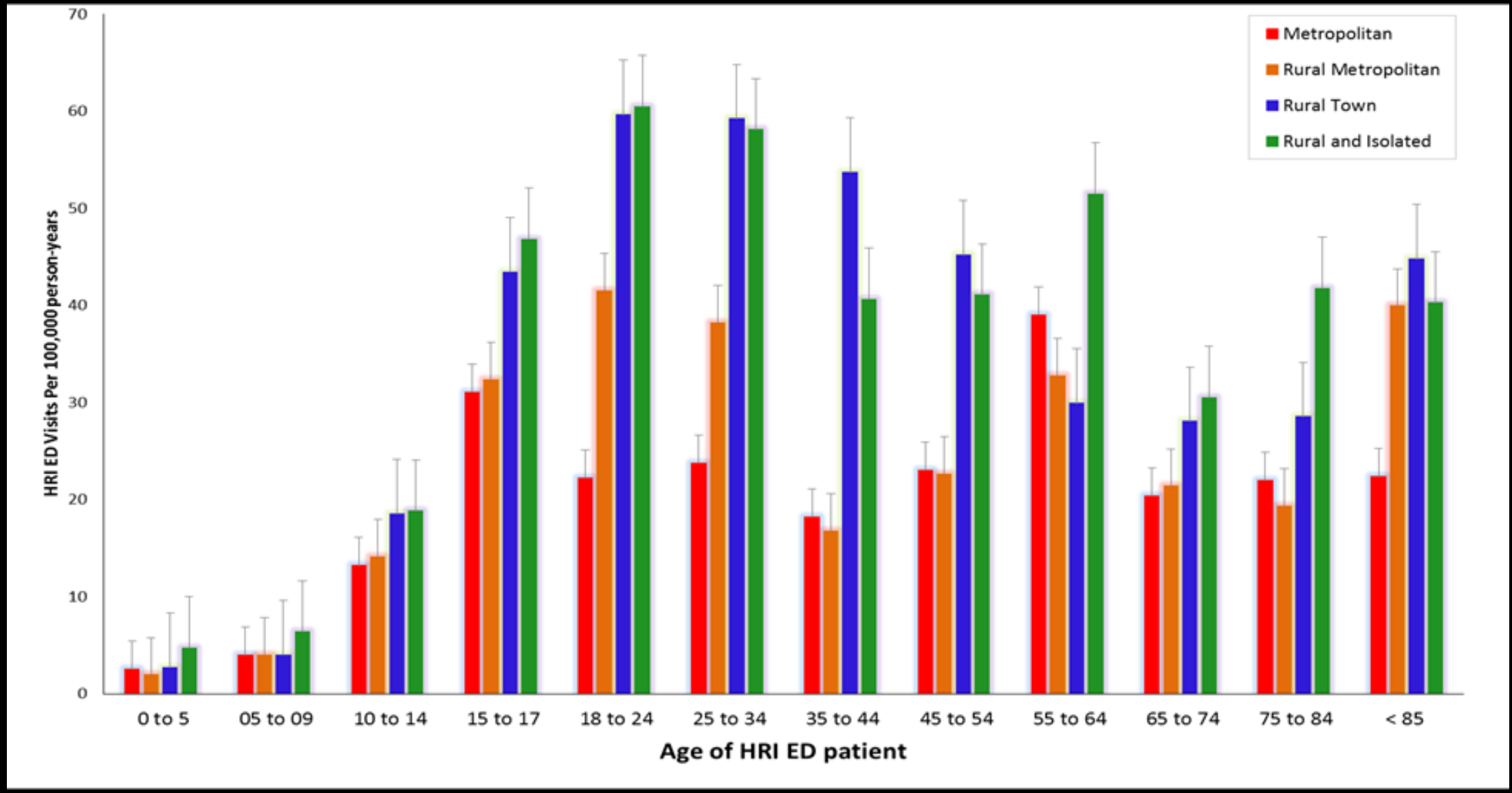
Detailed Rural Urban Commuting Areas Differences



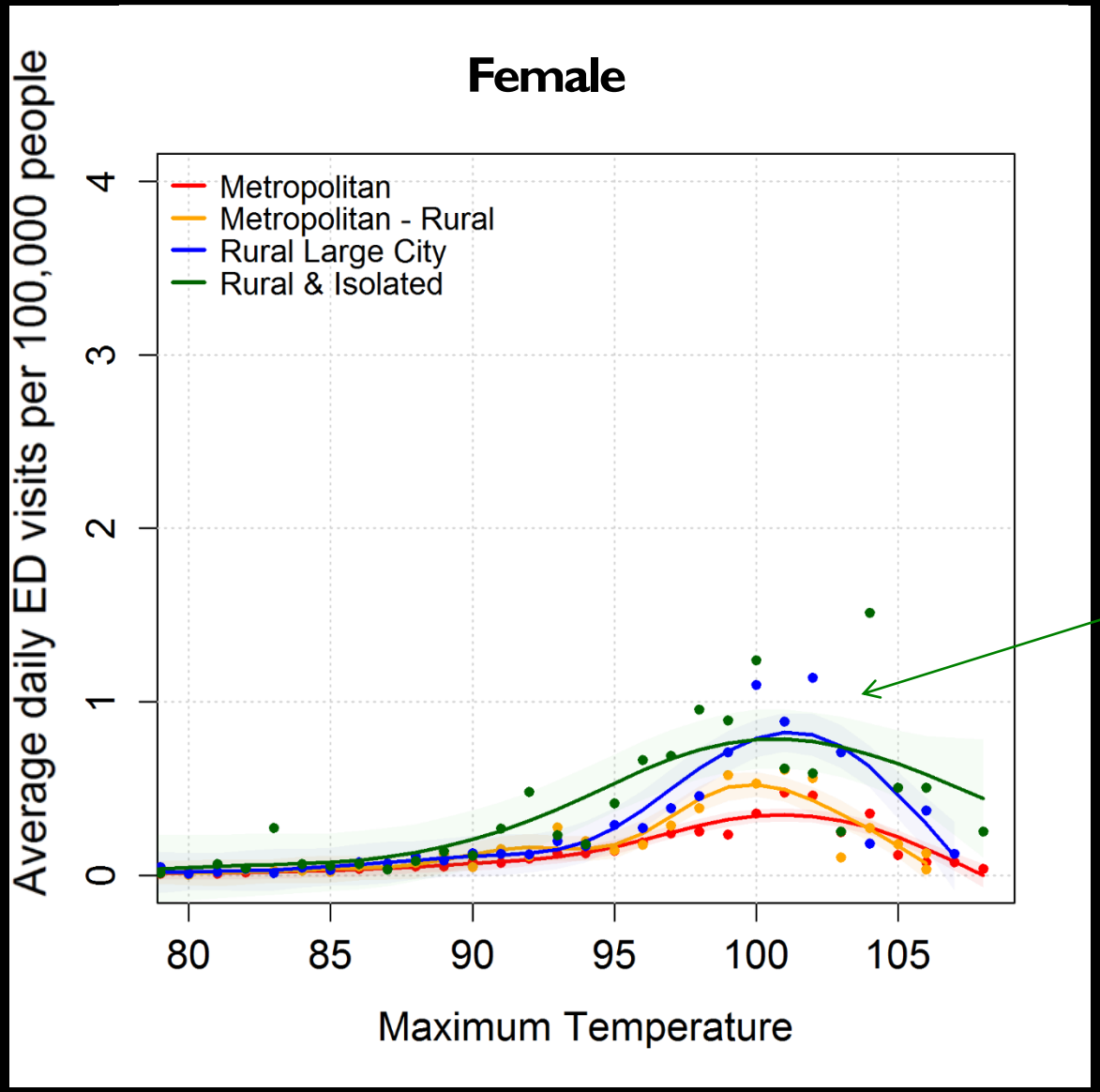
Urbanization

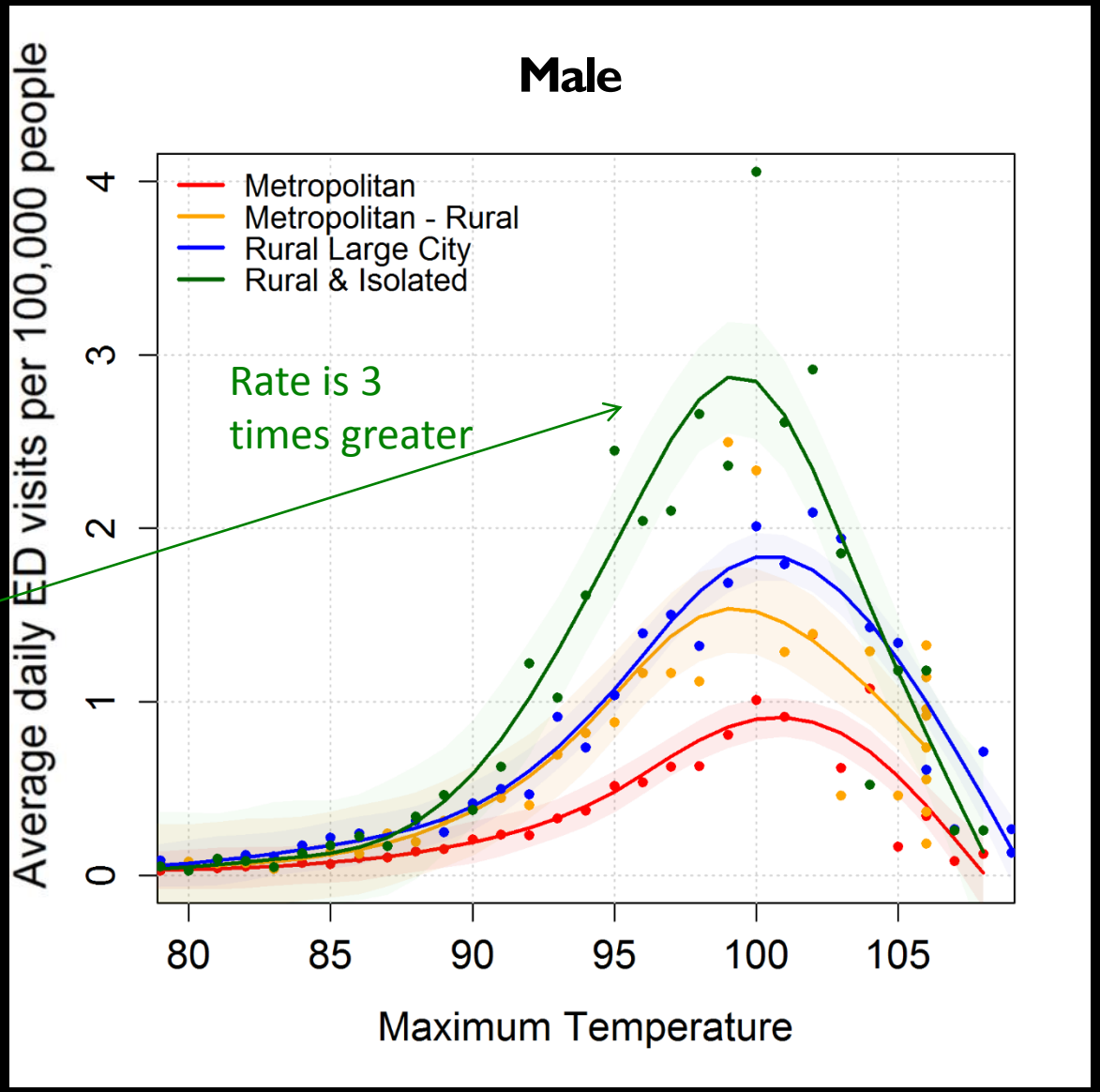
HRI

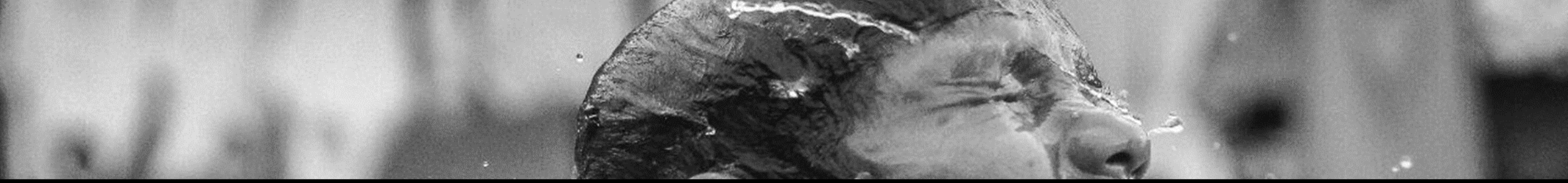
Rural Urban Commuting Areas -- Demographic



Gender Differences





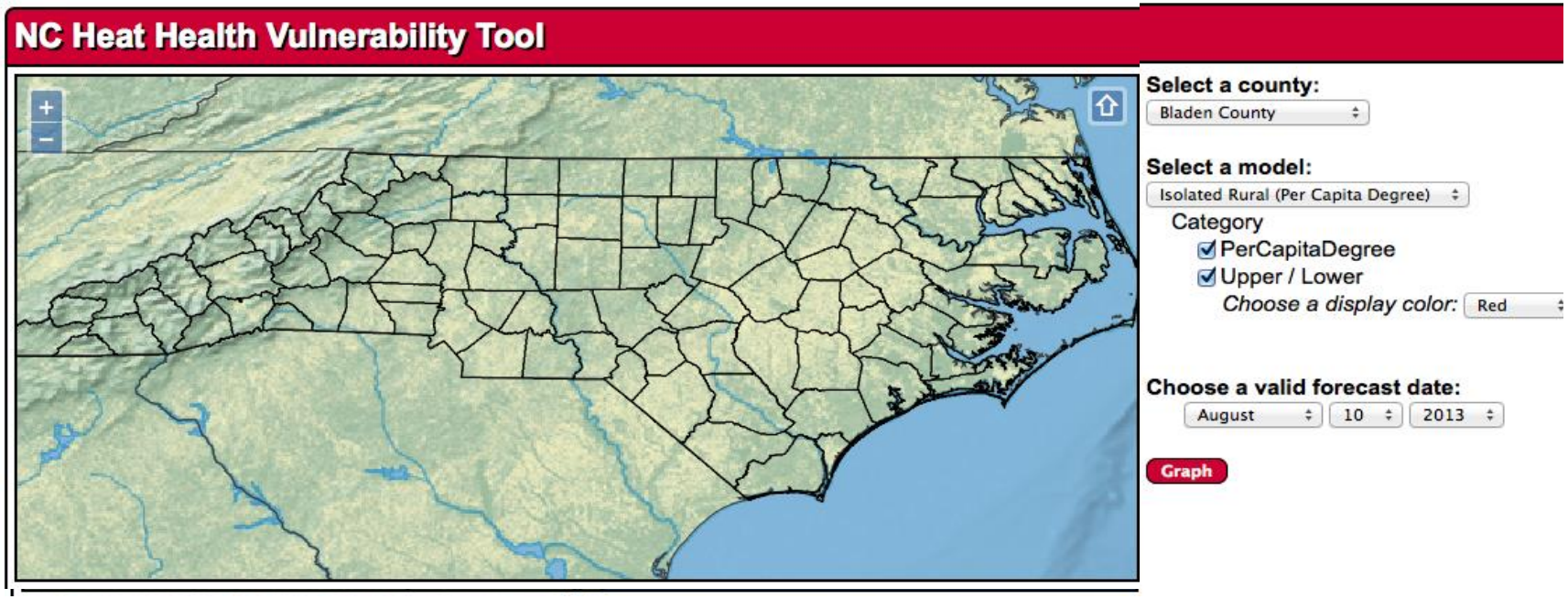


3. The Heat-Health Vulnerability Tool

Web-Based Heat-Health Vulnerability Tool (HHVT)

Inputs NWS maximum temperature forecasts and translates these values into predictions of the number of cases of heat illness.

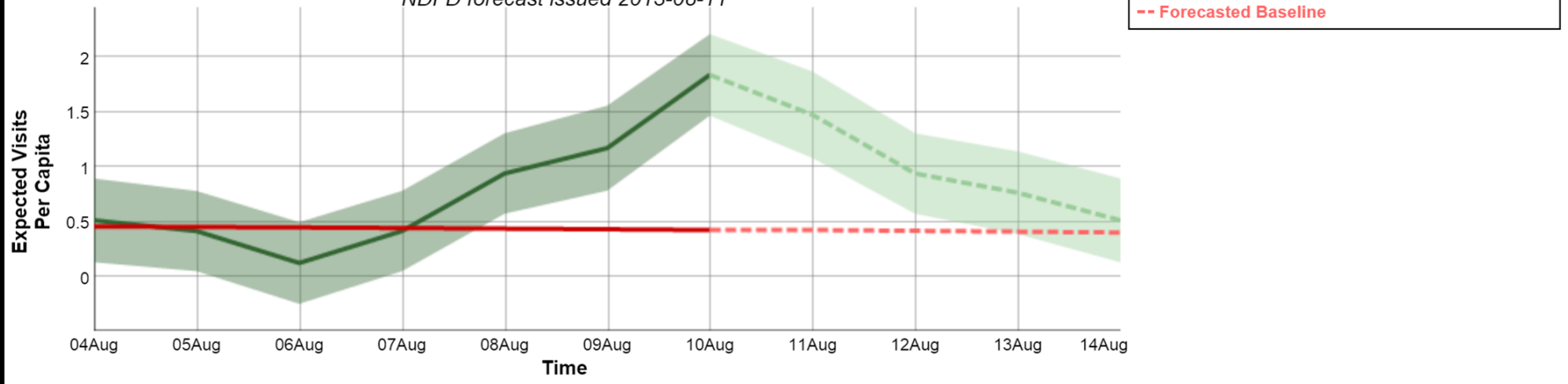
- County or region level
- Demographic/socioeconomic group
  (e.g. adult males, those in poverty etc.)



Piedmont/Coastal Plain Rural Metropolitan (Male 18-45 years old) Model for Robeson County at Lumberton Municipal Airport (KLBT)

Observations from 2013-08-04 through 2013-08-10

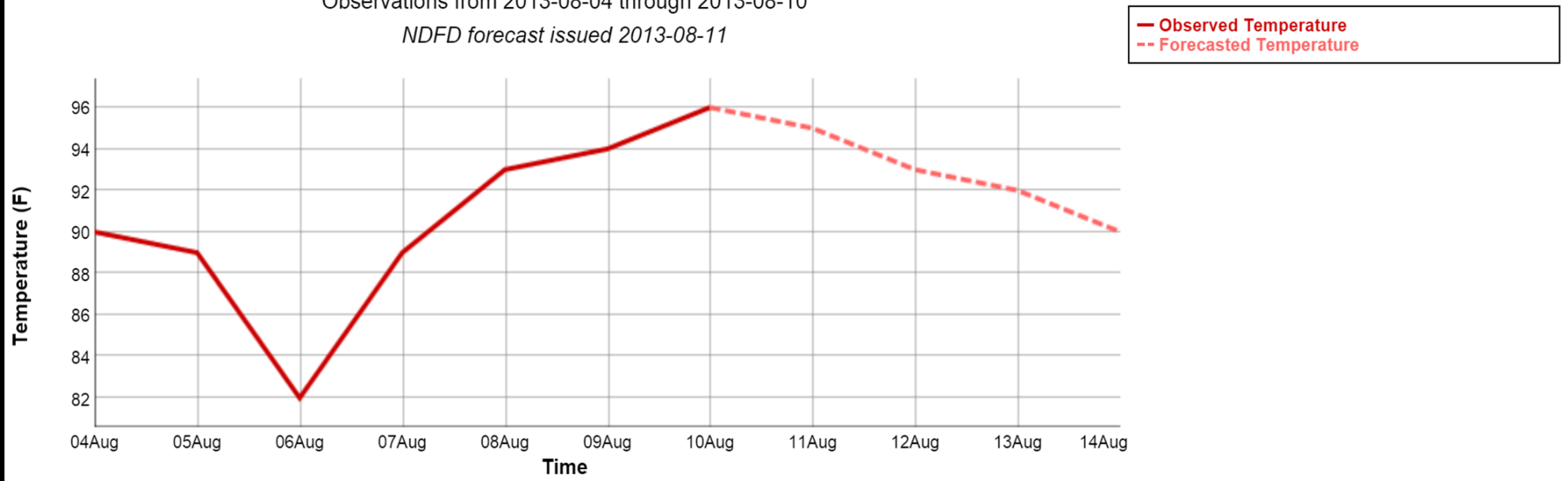
NDFD forecast issued 2013-08-11



Maximum Temperature for Robeson County at Lumberton Municipal Airport (KLBT)

Observations from 2013-08-04 through 2013-08-10

NDFD forecast issued 2013-08-11

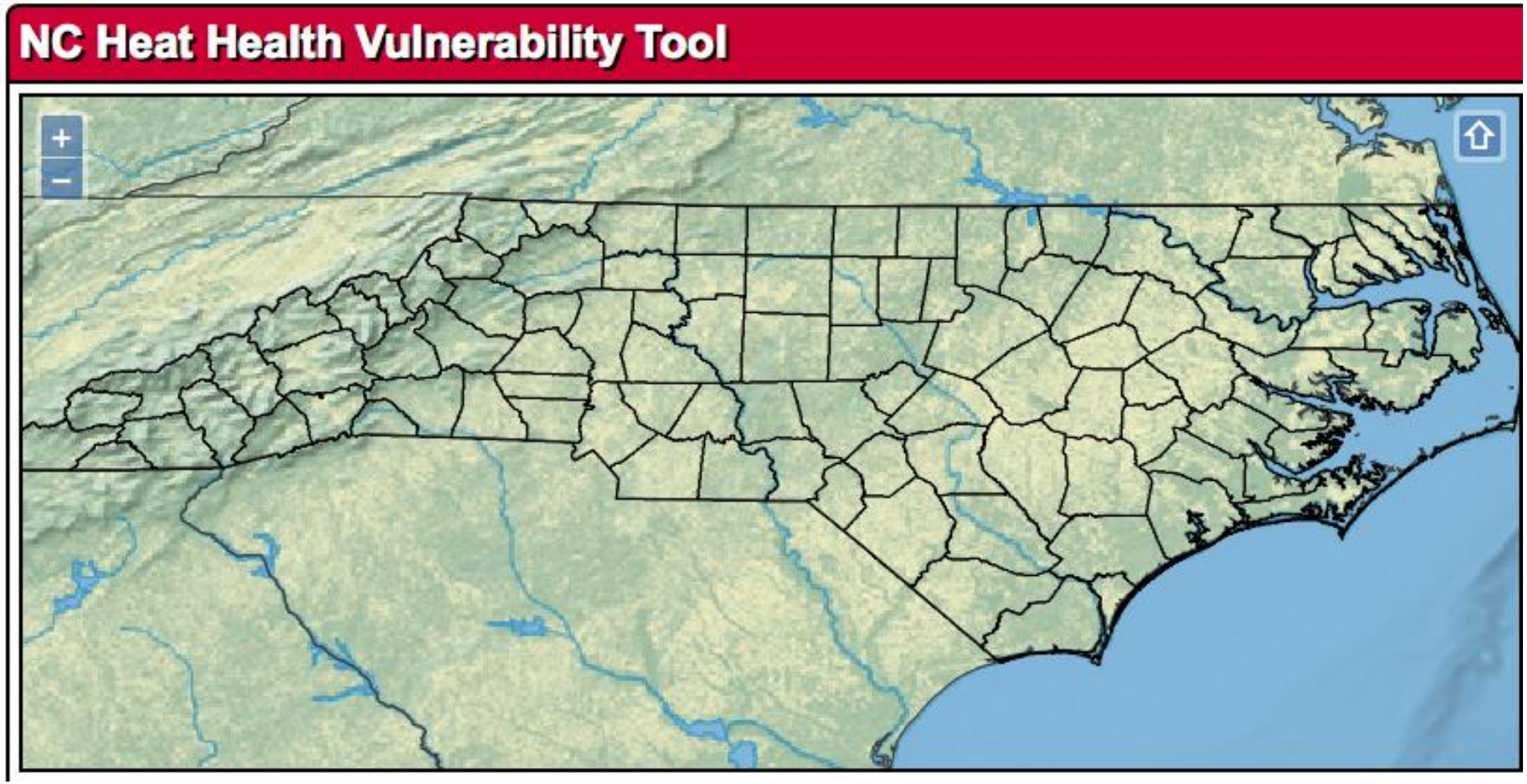


4. Our Engagement with Stakeholders and What We Learned

<u>Two User Engagement Sessions</u>

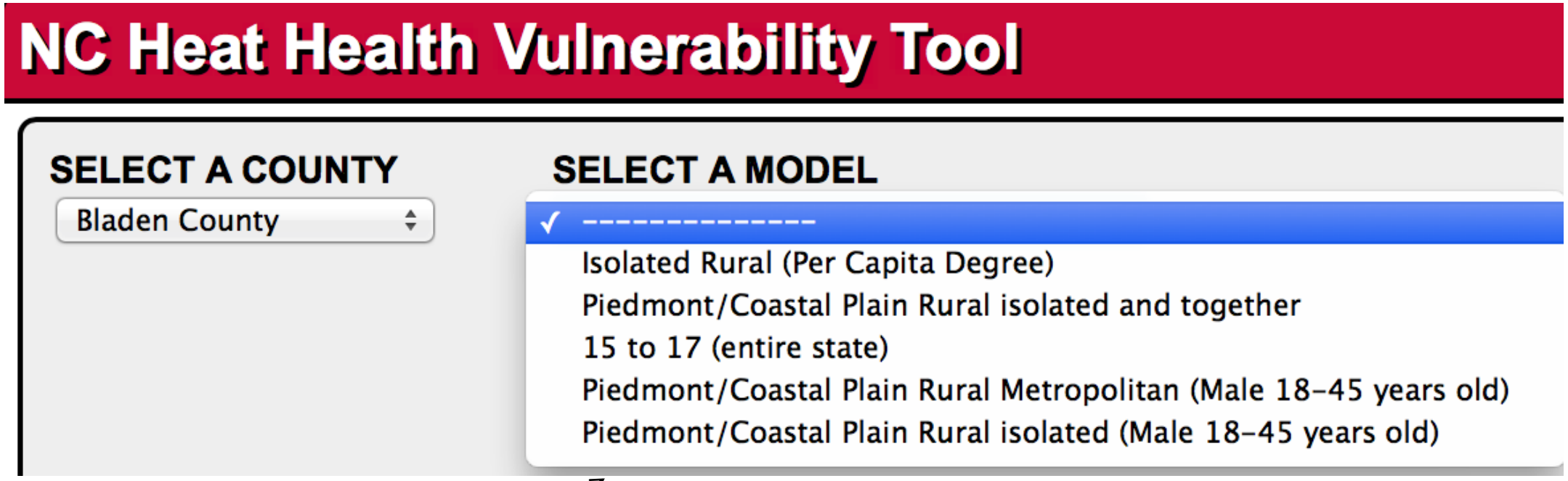
- **Webinar on 8/1/2015 in which tool was introduced**
- **Face-to-face meeting on 9/1/2105**

A. Challenges with the interface



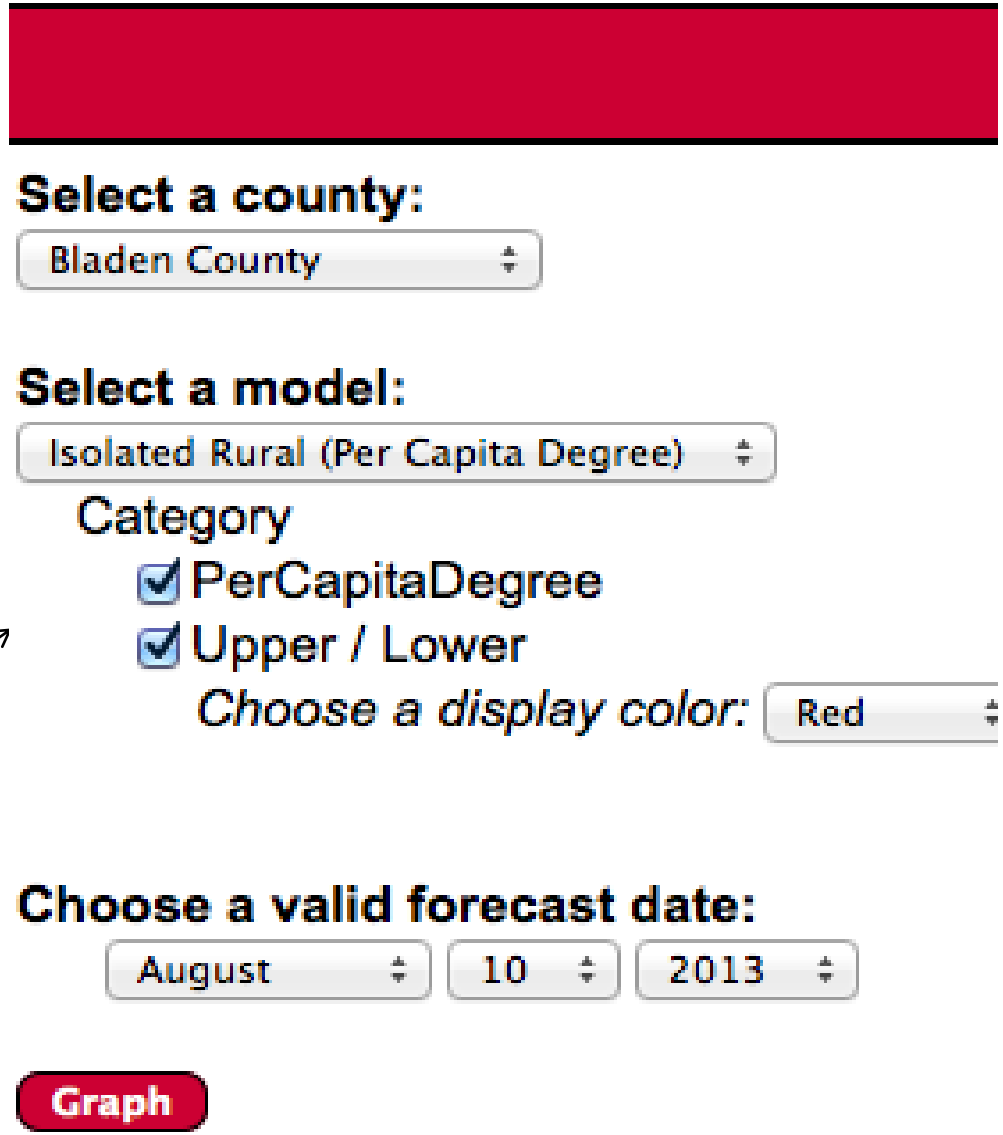
i. Clickable map

A. Challenges with the interface (continued)



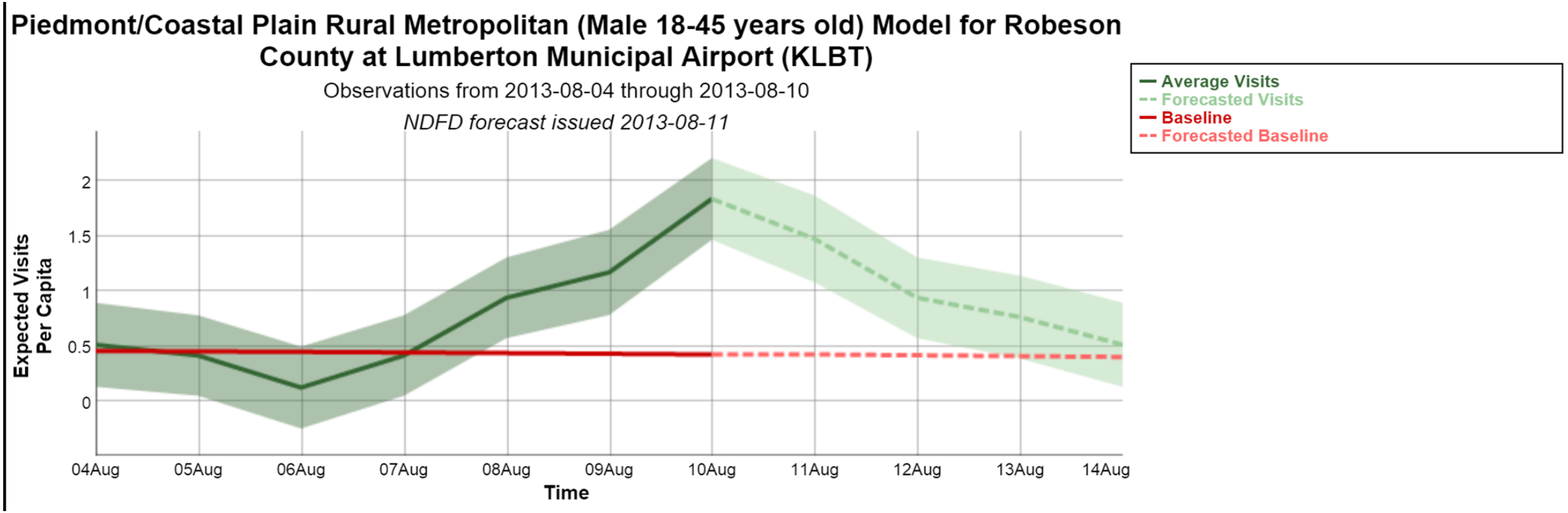
ii. Interpreting models

A. Challenges with the interface (continued)



iii. Providing plotting options

B. Interpreting the model output



i. For **average visits** and the **baseline**, what are the units "**expected visits per capita**"?

ii. What is "baseline"?

Express as a **departure from normal in units of percent**

Simply express as the "**normal**" or "**normal number of visits**"

C. How can level of threat posed by the heat be effectively expressed?

Air Quality Index for Ozone

Index Values (Conc. Range)	Air Quality Descriptors	Cautionary Statements for Ozone
0 – 50 (0-60 ppb)	Good	**No health impacts are expected when air quality is in this range.**
51 – 100 (61-75 ppb)	Moderate	**Unusually sensitive people should consider limiting prolonged outdoor exertion**
101 – 150 (76-104 ppb)	Unhealthy for Sensitive Groups	**Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion**
151 – 200 (105-115 ppb)	Unhealthy	**Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children should limit prolonged outdoor exertion.**
201 – 300 (116-374 ppb)	Very Unhealthy	**Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.**

- Much interest in translating the daily forecast into a threat level using a color scale from 1-5:

- Work with public health professionals to develop an appropriate scale.

D. “Its not the heat. It’s the humidity!”

http://marshallramsey.com/?p=11410

PLAN: Launch Version 2.0 of the Heat-Health Vulnerability Tool in May with the following upgrades:

1) Work off of predictions of the **daily maximum heat index**
2) Add a **threat scale** to each forecast
3) Refine interface and provide help menus and better explanations

Heat Health Vulnerability Tool: http://sercc.com/hhvt

Acknowledgements

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